

Considerate Operating on 145.825 MHz Digipeaters

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[The opinions expressed here are solely those of the author and do not represent the views of AMSAT.]

The return of the ISS packet digipeater to its traditional 145.825 MHz frequency in mid-April 2017 generated some discussion about how the frequency has been used. Along with a few others, I commented that I saw some stations that would transmit beacons without direct operator control (automatically). See amsat.org/pipermail/amsat-bb/2017-April/062934.html.

I have heard from hams who have questioned my opinions. I think it is time to go into more detail on why automatically controlled stations should not be transmitting on 145.825 MHz to the ISS (or NO-84), and why gateways don't need to transmit on that frequency.

One comment I received asked why a gateway shouldn't be able to advertise itself on 145.825 MHz through the orbiting digipeaters. For me, the answer is simple: stations working on 145.825 MHz aren't concerned with the call signs of any particular gateway. We use ARISS as the packet path in our radios or software, or use something like CQ VIA ARISS as the UNPROTO value in a TNC, so the digipeaters on the ISS and NO-84 will retransmit these packets. We don't need to add anything else to the ARISS path since gateways that receive these packets will pass them onto APRS Internet servers automatically. With that in mind, the gateways don't need to advertise their existence on 145.825 MHz.

Gateways, of course, are found on the Internet through websites like ariss.net (ISS) and pcsat.aprs.org (NO-84, NO-44), as well as other websites gathering APRS traffic like aprs.fi and findu.com, among others. Gateway operators also are free to use websites, including their QRZ.com pages to describe their stations on 145.825 MHz. I feel that any gateway identifying itself on that frequency is unnecessary and can contribute to congestion from time to time.

Let me make one point crystal clear. I



Photo 15 — The author sitting in the back of his SUV with the red shirt at TEAC, W5SI.



Photo 16 — SHARK, AI5M, site in Cleveland, Texas.

I ventured out once again for Field Day this year, visiting the TEAC (W5SI) site in Kingwood, Texas. Setting up my M2 Leo Pack with Armstrong rotors, Icom 2200H 2m mobile and Wouxun HT, I was able to make a contact on SO-50 for them. In Photo 15, I appear sitting in the back of my SUV with the red shirt. I then went to the SHARK (AI5M) site in Cleveland, Texas, for the next pass of SO-50 (Photo 16). I brought multiple radios and even had my Icom IC-9100 for backup. I was not successful on this pass as it was low to the horizon and the bird for some reason was very busy (hi!). As with all the other field day groups, satellite operations are always one heck of a hit.

For next year, remember, Murphy will somehow visit someone and spoil the day. Be prepared and have extra equipment, cables and connectors.

Here is a table of all entries received. In the case of a tie, the call signs are listed alphabetically. ☸

	Call	Class	QSOs
1	W0GQ	2A	199
2	K6MMM	3A	80
3	K4LRG	5A	63
4	W6PA	2A	56
5	K4LKL	4A	52
6	W4MLB	2F	35
7	N4O	3A	35
8	N8HM	1B	30
9	KB6LTY	1E	29
10	K6FW	1D	28
11	W5FC	4A	25
12	KB6A	1D	22
13	VE3SAR	3A	21
14	W3BQC	3A	17
15	W1BIM	6A	14
16	K5COW	4A	14
17	WE7GV	2A	12
18	WD9EWK	1B	10
19	N9IP/VE7	1A	8
20	W3CWC	6A	7
21	N4EH	5A	6
22	W0JW	1D	5
23	VE7ECA	1A	5
24	WA5KBH	1D	2
25	W5SI	6F	1
26	W7RCH	1F	1
27	WA3NAN	3F	1

appreciate the operators of gateway stations, and the time and money these operators have invested so that the APRS-related websites have their information. Many operators use these sites to confirm the orbiting digipeater is in operation and that their stations are working properly.

For amateur operators in the U.S., FCC Part 97 has a fair bit to say about the way we should operate on that frequency. Regulations in many other countries are not as detailed as those established by the FCC on how we should operate on different frequencies and bands. I will discuss how some sections of this part of the FCC rules relate to operations on 145.825 MHz.

Some may justify automatic beaconing simply by the fact that APRS software, TNCs, and APRS-ready radios have the ability to automatically transmit packets. However, the mere existence of such technical capabilities does not mean we can use this functionality on any amateur frequency. FCC Part 97 allows automatic operation of only certain types of stations, and only in some cases and in specific portions of our bands. I will discuss each of these types of stations. (For reference, see FCC Part 97 on the ARRL website at www.arrl.org/part-97-text; the most current official version can be found at www.ecfr.gov/cgi-bin/retrieveECFR?gp=&SID=148e2688652ed14bbdac1ee43afdf253&mc=true&n=sp47.5.97.c&r=SUBPART&ty=HTML#se47.5.97_1201.

Auxiliary stations, as described in 97.201(d), may be controlled automatically. This class of station usually encompasses "remote bases," the simplex nodes for systems like EchoLink or IRLP, and sometimes simplex phone patches. But for stations working 145.825 MHz, or in the 2 m satellite subband at 145.8-146.0 MHz, auxiliary stations are not allowed per 97.201(b).

Beacon stations are allowed to be automatically controlled on various bands, per 97.203(b). For the 2 m band, beacons are permitted at 144.275-144.300 MHz only, not 145.825 MHz. This means we cannot consider our stations as beacons, for purposes of allowing our stations to operate on 145.825 MHz under automatic control.

Repeaters are allowed to operate under automatic control, per 97.205(d). But repeaters are not permitted to use (among other subbands) 145.5-146.0 MHz. Even if a station on the ground is retransmitting what it hears on 145.825 MHz and another frequency, following the definition of a

repeater at 97.3(a)(40):

"Repeater. An amateur station that simultaneously retransmits the transmission of another amateur station on a different channel or channels." We cannot operate a repeater station that uses 145.825 MHz.

Space stations are allowed to automatically retransmit other signals per 97.207(d) and are also permitted to make one-way transmissions per 97.207(e). Unfortunately for us on the ground, our stations do not qualify as space stations. Per 97.3(a)(41):

"Space station. An amateur station located more than 50 km above the Earth's surface." Since we aren't operating from an altitude of 50 km, we cannot consider our stations as space stations for purposes of having our stations operate using automatic control.

The last section in FCC Part 97, which allows amateur stations to operate digitally under automatic control, is a section with a long title, "Automatically controlled digital station" (97.221). This category of station is probably the closest match for our stations that use packet on 145.825 MHz to work the ISS and NO-84. The first section in this part rules that out: "This rule section does not apply to an auxiliary station, a beacon station, a repeater station, an earth station, a space station, or a space telecommand station."


FCC Part 97's definition of "earth station" found at 97.3(a)(16):

"Earth station. An amateur station located on, or within 50 km of, the Earth's surface intended for communications with space stations or with other Earth stations by means of one or more other objects in space."

This means our stations are not permitted to employ automatic control when working any satellite using digital modes like packet.

Since this covers the categories of amateur stations which are permitted to employ automatic control under FCC Part 97, and our packet stations which use 145.825 MHz with orbiting digipeaters are not covered by any of those categories, what does this mean for us? It simply means that amateur stations on U.S. territory, or operating on any territory covered by FCC rules, are not permitted to employ automatic control on 145.825 MHz. An amateur operator must be present whenever that operator's station transmits on 145.825 MHz to be in compliance with FCC Part 97. The operator must either be at the station or use remote control to operate the station whenever

working a satellite on that frequency. Reading these sections together, automatic control of amateur radio stations is not permitted anywhere in the 145.8-146.0 and 435-438 MHz satellite subbands, not just the 145.825 MHz frequency used by the digipeaters on the ISS and NO-84.

If operators abide by these sections of FCC Part 97 when working the digipeaters on the ISS and NO-84, fewer beacons will clutter 145.825 MHz for no good reason. This would also give more time during these passes for stations to make contacts with other stations. We would never tolerate stations automatically transmitting their call signs to SO-50, FO-29, or any satellite in other modes, repeatedly during passes. We should expect the same for the orbiting digipeaters. 

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